



AP/IFW

Attorney Docket 209546-81208 (formerly 65961-0054)
U.S. Application No.: 10/608,730

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

In re application of: **David M. Cumming et al.** Confirmation No. **7694**
Application No.: **10/608,730** Group No.: **3612**
Filed: **June 27, 2003** Examiner: **D. Pedder**
For: **MULTIPLE MATERIAL BUMPER BEAM**

**Commissioner for Patents
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BRIEF ON APPEAL

Honorable Sir:

This Appeal is taken from the Examiner's Final Rejection dated June 11, 2004 (Paper No./Mail Date 6042004) of Claims 1-10, 15, 16 and 21-23 in the above-identified application. The Notice of Appeal was timely filed on October 12, 2004. Submitted herewith are three additional copies of this Appeal Brief.

(1) Real Party In Interest

The Real Party In Interest is Magna International Inc.

(2) Related Appeals and Interferences

None.

(3) Status Of Claims

Claims 1-10, 15, 16 and 21-23 are pending in the application and are involved in this Appeal. The present application was filed on June 27, 2003 with originally-filed Claims 1-20. In response to a first Office action dated February 24, 2004 (Paper No./Mail Date 2202004), Claims 1, 6, 8-10 and 16 were amended, Claims 11-14 and 17-20 were canceled, and Claims 21-23 were added. In response to a final Office action dated June 6, 2004 (Paper No./Mail Date 6042004), Appellant filed a Amendment After Final Rejection on August 30, 2004 without amending the claims. In response to an Advisory Action dated September 16, 2004 (Paper No. 9142004), Appellants filed a Notice of Appeal on October 12, 2004. No claims have been allowed.

(4) Status Of Amendments

The Advisory Action dated September 16, 2004 (Paper No. 9142004) indicates that the Amendment After Final Rejection filed August 30, 2004 amending the specification and drawings will be entered for purposes of Appeal.

(5) Summary Of The Invention

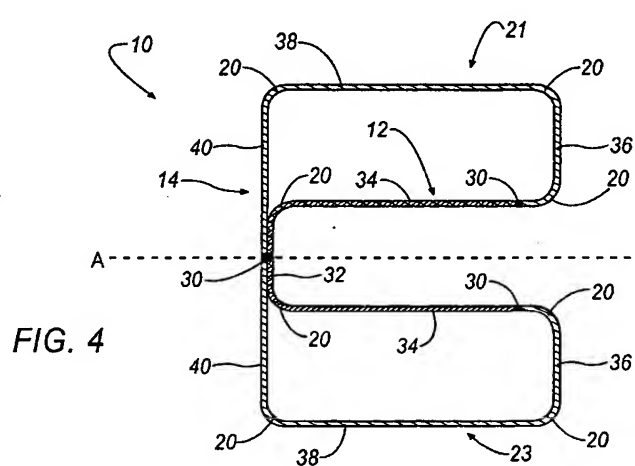
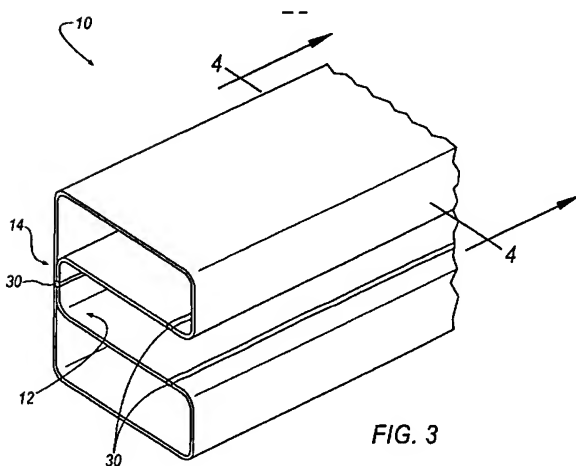
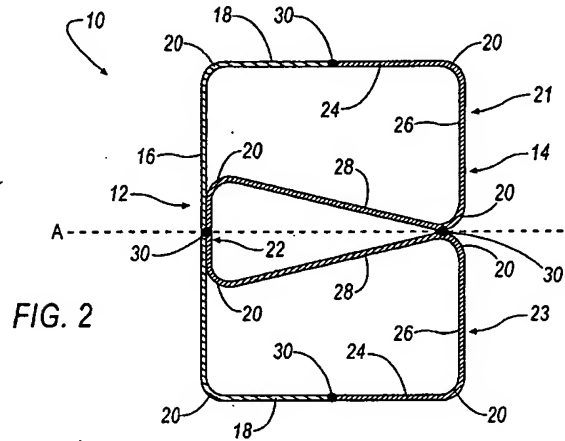
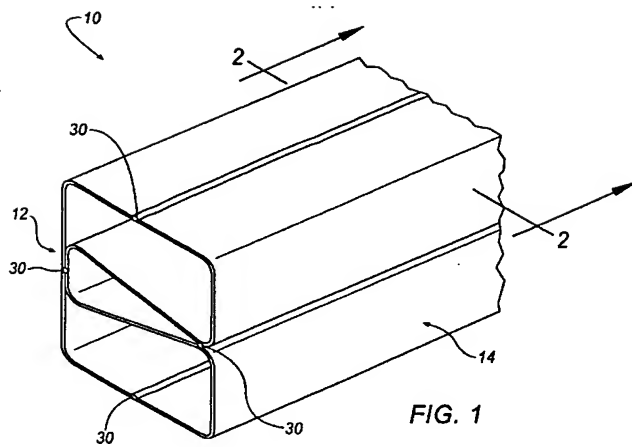
By way of background, automotive designers are continually trying to balance the need for lightweight, fuel efficient automobiles with safety standards and regulations imposed by the government and insurance companies. One such automotive component subject to heavy regulation is bumper assemblies with regard to crash safety standards. The bumper assembly is traditionally comprised of a bumper beam made of a metallic material with the requisite strength to conform to governmental standards for low and high speed crashes. Often, the strong metallic beam is heavy and adds significant weight to the vehicle, thereby

reducing fuel efficiency. There is a need in the automotive industry to develop a bumper assembly having a bumper beam with an increased strength to weight ratio by lowering the overall weight of the bumper assembly. The improved bumper assembly must still be strong enough to provide excellent performance in high speed and low speed crashes.

Furthermore, automotive manufacturers desire components that are affordable and easy to produce in a mass production operation. Traditional bumper assemblies are roll-formed, whereby a flat steel strip extends through a series of rollers to shape the steel into a desired form. Complex bumper beam designs, while providing the necessary strength to conform to safety standards, add to the time and cost of the manufacturing process. Thus, there is a need in the automotive industry to produce a bumper beam that provides strength adequate to conform to safety standards, lightweight to improve fuel efficiency and simple to manufacture.

The inventors of the present invention have recognized these and other problems associated with the traditional bumper beams described above. To this end, the inventors have developed a bumper beam that weighs less while maintaining high quality standards related to impact or crash testing.

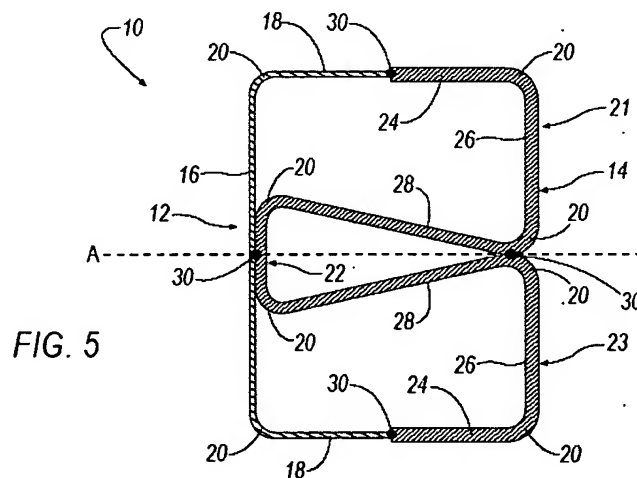
Referring to Figures 1-4 below, a bumper beam, generally referred at 10, is shown according to an embodiment of the invention. The bumper beam 10 is an elongated beam having a first portion 12 and a second portion 14. In one embodiment, the second portion 14 is fixedly attached to a vehicle (not shown) by traditional techniques, such as fasteners, bracket assemblies, or the like. The first portion 12 extends outwardly from the vehicle and is usually first to contact an external object (not shown) during a crash. The positions of the first portion 12 and second portion 14 are merely illustrative. Alternatively, the second portion 14 may be attached to the vehicle while the first portion 12 extends outwardly from the vehicle.



One aspect of the invention is that the first portion 12 and the second portion 14 are made from materials having different material properties. By way of example, the first portion 12 can be made from a first material that is generally higher strength (tensile strength or yield strength) than the second portion 14 made from a second material. It has been found that forming the first portion 12 with the first material having a greater strength enables the bumper beam 10 to greater withstand the forces generated on the bumper beam 10 during a crash, as compared to a bumper beam made of a single material having a lesser strength than the first material. Although the second portion 14 is made from the second material having a lesser strength (tensile strength or yield strength) than the first material, the second material may weigh less or the same as the first material. It has been found that the combination of

the higher strength first material and the lighter or equal weight second material provides a bumper beam 10 with an increased or higher strength to weight ratio, as compared with traditional bumper assemblies made of a single material. The increased strength to weight ratio provides a bumper beam that conforms to governmental standards regarding high and low speed crashes, while also improving fuel efficiency of the vehicle. As a further example, the second material of the second portion 14 may be of generally higher strength (tensile strength or yield strength) than the first material of the first portion 12, while the first material weighs less than or equal to the second material. Any combination of materials having different material properties that results in an increased or higher strength to weight ratio of the bumper beam is contemplated by the present invention.

As shown in Figure 5 below, the first material can be of a different gauge than the second material. For example, the first material of the first portion 12 can have a lesser thickness than the second material of the second portion 14 because the first material comprises a higher strength material than the second material. In contrast, if the second material has a higher strength than the first material, then the second material may have a lesser thickness than the first material.



Another aspect of the invention is that the first portion 12 and the second portion 14 are fixedly attached to each other at one or more locations, indicated at 30. In the embodiments shown in Figures 1, 2 and 5 above, the end of each of the legs 18 of the first portion 12 and at the end of each of the legs 24 of the second portion 14 abut each other and

are fixedly attached together, such as by welding or the like. In addition, the connecting segment 22 is also welded to the back 16 of the first portion 12 at a location 30 along the longitudinal axis, A, of the bumper beam 10. Finally, the bending portions 20 formed between the back 26 and the legs 28 are welded to each other along the longitudinal axis, A, of the bumper beam 10. As can be seen in Figure 2, the bumper beam 10 is generally mirror symmetric with respect to the longitudinal axis, A. As a result, the location 30 at which the back 16 is welded to the connecting section 22 and the location 30 at which the bending portions 20 formed between the back 26 and the legs 28 are welded lie along a midpoint between the legs 18 of the first portion 12.

In the embodiment shown in Figures 3 and 4 above, the end of each of the legs 34 of the first portion 12 and the end of each of the legs 36 of the second portion abut each other and are welded together. Further, the back 32 of the first portion 12 is welded to the legs 40 of the second portion 14 along the axis, A, of the bumper beam 10.

(6) Issues

A. Are Claims 1, 2, 6 and 7 unpatentable under 35 USC §102(b) as being anticipated by Golze et al. (U.S. Patent No. 3,779,592, hereinafter “Golze”)?

B. Are Claims 1, 2, 3, 6 and 7 unpatentable under 35 USC §102(b) as being anticipated by Carpenter (U.S. Patent No. 5,154,462, hereinafter “Carpenter”)?

C. Are Claims 1, 2, 3, 6 and 7 unpatentable under 35 USC §102(b) as being anticipated by Himsl (U.S. Patent No. 6,360,441, hereinafter “Himsl”)?

D. Is Claim 3 unpatentable under 35 USC §103(a) over Golze in view of Stewart et al. (U.S. Patent No. 6,000,738, hereinafter “Stewart”)?

E. Is Claim 4 unpatentable under 35 USC §103(a) over Golze, Carpenter or Himsl in view of Glance (U.S. Patent No. 5,779,991, hereinafter “Glance”)?

F. Is Claim 5 unpatentable under 35 USC §103(a) over Golze, Carpenter or Himsl?

G. Are Claims 8, 9, 10 and 15 unpatentable under 35 USC §103(a) over Carpenter or Himsl in view of Sturuss (U.S. Patent No. 5,813,594, hereinafter “Sturuss”)?

H. Are Claims 16, 21, 22 and 23 unpatentable under 35 USC §103(a) over Golze or Carpenter in view of Sturuss?

(7) Grouping Of Claims

Claims 1, 16 and 22 are separately patentable. Dependent Claims 2-10 and 15 stand or fall with independent Claim 1. Dependent Claim 21 stands or falls with independent Claim 16. Dependent Claim 23 stands or falls with independent Claim 22.

(8) Argument

A. Claims 1, 2, 6 and 7 Are Not Anticipated By Golze

The Examiner rejected Claims 1-2 and 6-7 under 35 U.S.C. §102(b) over Golze. Appellant respectfully traverses this rejection, and submits that these claims are not anticipated in view of the cited prior art for several reasons.

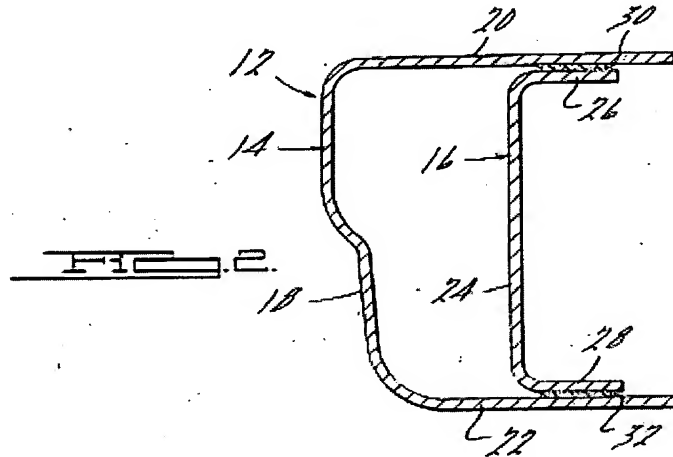
Independent Claim 1 specifies, inter alia, a bumper beam comprising a first portion comprising a first material having a first end and a second end; and a second portion comprising a second material having a first end abutting the first end of the first portion and a second end abutting the second end of the first portion, wherein the first material has different material properties than the second material.

The Examiner asserts that Golze discloses ends abutted or joined because the claims are open ended as to the exact location of “end.” *See Paragraph 6 of the final Office action dated June 11, 2004.* Appellant respectfully disagrees with this assertion.

It is appropriate to compare the meaning of terms given in technical dictionaries in order to ascertain the accepted meaning of a term in the art. Further, a term may not be given a meaning repugnant to its usual meaning. *See MPEP §2173.05(a).* By definition, the term “end” is defined as “the extreme or last part lengthwise; the terminal unit of something spatial that is marked off by units.” *See Appendix A attached hereto.* In addition, the definition of the term “abut” is defined as “to touch along a border or with a projecting part.” *See Appendix B attached hereto.* As described in the specification and shown in the drawings, the end of the first portion 12 abuts the end of the second portion 14. Thus, the specification and drawings do not use a definition that is a different than the ordinary meaning of the term “end,” and the Examiner’s assertion is misplaced.

As shown in Figure 2 below, Golze discloses a front bumper 12 including a C-shaped outer member 14 having a vertical portion 18 and substantially horizontal, spaced apart arms

20, 22. The bumper 12 also includes a C-shaped inner member 16 made of aluminum alloy having a substantially vertical portion 24 and substantially horizontal, spaced apart arms 26, 28. The outer member 14 and the inner member 16 are joined together by an adhesive layer 30 between the upper horizontal arms 20, 26, and an adhesive layer 32 between the lower arms 22, 28.



A claim is anticipated only if each and every element as set forth in the claim is found either expressly or inherently described in a single prior art reference. *See MPEP §2131.*

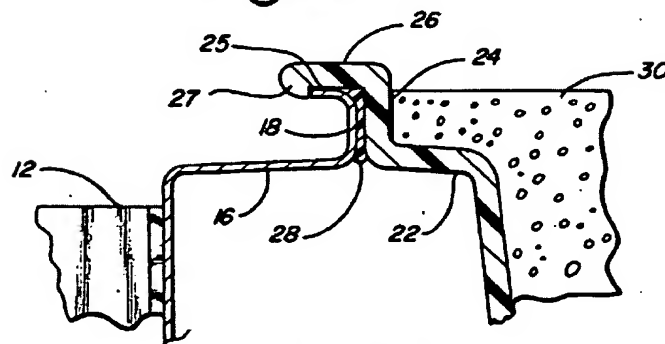
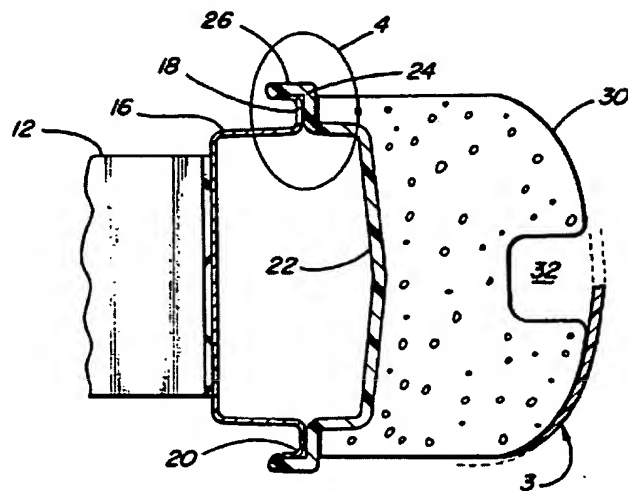
There is no mention whatsoever in Golze of at least the feature of a first portion having a first end and a second end, and a second portion comprising a second material having a first end abutting said first end of said first portion and a second end abutting said second end of said first portion, as recited in Claim 1. To the contrary, the ends of the outer and inner members 14, 16 of Golze do not abut each other, but rather overlap each other. Thus, Golze is not identical to the claimed invention.

In view of the foregoing, Claim 1 is allowable over the applied art. Claims 2, 6 and 7, which depend from Claim 1, are likewise allowable over the applied art. Thus, the Examiner's rejection of Claims 1, 2, 6 and 7 under 35 U.S.C. §102(b) over the applied art should be reversed.

B. Claims 1, 2, 6 and 7 Are Not Anticipated By Carpenter

The Examiner rejected Claims 1-3 and 6-7 under 35 U.S.C. §102(b) over Carpenter. Appellant respectfully traverses this rejection, and submits that these claims are not anticipated in view of the cited prior art.

Carpenter discloses a bumper beam 10 including a cross member 16 attached to frame rails 12 and a bumper facebar 22 made from a different material. As shown in Figures 3 and 4 below, the cross member 16 is attached to the bumper facebar 22 by applying an adhesive 28 to one of a first edge portion 18 of the cross member 16 and a second edge portion 24 of the bumper facebar 22.



Similar to Golze, there is no mention whatsoever in Carpenter of at least the feature of a first portion having a first end and a second end, and a second portion comprising a second material having a first end abutting said first end of said first portion and a second end abutting said second end of said first portion, as recited in Claim 1. To the contrary, the ends of the cross member 16 and the bumper facebar 22 of Carpenter do not abut each other, but rather overlap each other. Thus, Carpenter is not identical to the claimed invention.

In view of the foregoing, Claim 1 is allowable over the applied art. Claims 2, 3, 6 and 7, which depend from Claim 1, are likewise allowable over the applied art. Thus, the Examiner's rejection of Claims 1, 2, 3, 6 and 7 under 35 U.S.C. §102(b) over the applied art should be reversed.

C. Claims 1, 2, 3, 6 and 7 Are Not Anticipated By Himsl

The Examiner rejected Claims 1-3 and 6-7 under 35 U.S.C. §102(b) over Himsl. Appellant respectfully traverses this rejection, and submits that these claims are not anticipated in view of the cited prior art.

In one embodiment shown below, Himsl discloses a bumper beam assembly 10 including a bumper beam member 12 affixed to a bumper beam structure 14.

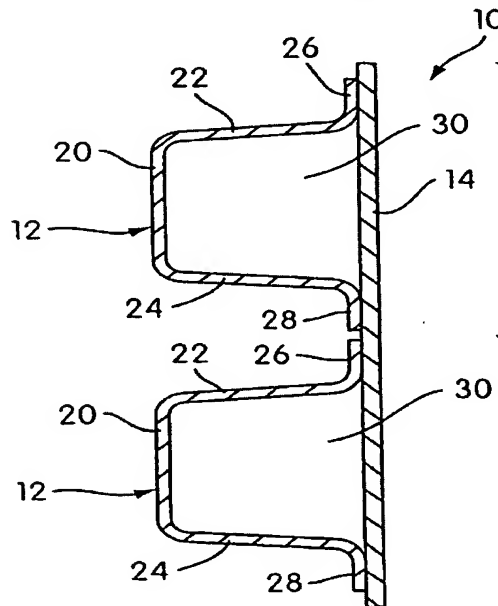


FIG. 5

Similar to Golze and Carpenter, there is no mention whatsoever in Himsl of at least the feature of a first portion having a first end and a second end, and a second portion comprising a second material having a first end abutting said first end of said first portion and a second end abutting said second end of said first portion, as recited in Claim 1. To the contrary, the ends of the bumper beam member 12 and the bumper beam structure 14 do not abut each other, but rather overlap each other. Thus, Himsl is not identical to the claimed invention.

In view of the foregoing, Claim 1 is allowable over the applied art. Claims 2, 3, 6 and 7, which depend from Claim 1, are likewise allowable over the applied art. Thus, the Examiner's rejection of Claims 1, 2, 3, 6 and 7 under 35 U.S.C. §102(b) over the applied art should be reversed.

D. Claim 3 Is Not Obvious In View Of Golze And Stewart

The Examiner rejected Claim 3 under 35 U.S.C. §103(a) over Golze in view of Stewart.

In Paragraph 9 of the final Office action dated June 11, 2004, the Examiner rejected Claim 3 stating:

"It would have been obvious to one of ordinary skill to provide in any reference above different thicknesses in various portions of the bumper as taught by Stewart et al. for reinforcement under load to resist same."

Appellant respectfully traverses this rejection, and submits that Claim 3 is not obvious in view of the cited prior art.

According to MPEP §2143, to establish a *prima facie* case of obviousness, three criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. *In re Linter*, 458 F.2d 1013, 173 USPQ 560, 562 (CCPA 1972). Second, there must be a reasonable expectation of success. *In re Merck & Co., Inc.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Finally, the applied reference must teach or suggest all the claim limitations. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests

the desirability of the combination. *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990). Further, the fact that the claimed invention is within the capabilities of one of ordinary skill in the art is not sufficient by itself to establish a *prima facie* case of obviousness without some objective reason to combine the teachings of the references. *Ex parte Levengood*, 28 USPQ2d 1300 (Bd. Pat. App. & Inter. 1993). Further, it is well established that even if all elements of a claim are disclosed in the prior art, the claimed invention taken as a whole cannot be said to be obvious without some reason given in the prior art why one of ordinary skill would have been prompted to combine the teachings of the prior art to arrive at the claimed invention. *In Re Regal*, 188 U.S.P.Q. 136,139 n.6 (C.C.P.A. 1975).

Claim 3 depends from Claim 1. There is no mention whatsoever in Stewart of at least the feature of a first portion having a first end and a second end, and a second portion comprising a second material having a first end abutting said first end of said first portion and a second end abutting said second end of said first portion, as recited in Claim 1.

In view of the foregoing, it is respectfully submitted that the Examiner fails to establish a *prima facie* case of obviousness because the combination of Golze and Stewart does not disclose all the claim limitations, as recited in Claim 3, which depends from Claim 1.

For at least this reason, Claim 3 is allowable over the applied art, taken singly or in combination. Thus, the Examiner's rejection of Claim 3 under 35 U.S.C. §103(a) over the applied art should be reversed.

E. Claim 4 Is Not Obvious In View Of Carpenter or Himsl and Glance

The Examiner rejected Claim 4 under 35 U.S.C. §103(a) over Carpenter or Himsl in view of Glance.

In Paragraph 10 of the final Office action dated June 11, 2004, the Examiner rejected Claim 4 stating:

"It would have been obvious to one of ordinary skill to provide in any references above Martensitic steel as taught by Glance as a known material for this environment."

Appellant respectfully traverses this rejection, and submits that Claim 4 is not obvious

in view of the cited prior art.

Claim 4 depends from Claim 1. There is no mention whatsoever in Glance of at least the feature of a first portion having a first end and a second end, and a second portion comprising a second material having a first end abutting said first end of said first portion and a second end abutting said second end of said first portion, as recited in Claim 1.

In view of the foregoing, it is respectfully submitted that the Examiner fails to establish a *prima facie* case of obviousness because the combination of Carpenter, Himsl and Glance does not disclose all the claim limitations, as recited in Claim 4, which depends from Claim 1.

For at least this reason, Claim 4 is allowable over the applied art, taken singly or in combination. Thus, the Examiner's rejection of Claim 4 under 35 U.S.C. §103(a) over the applied art should be reversed.

F. Claim 5 Is Not Obvious In View Of Golze, Carpenter or Himsl

The Examiner rejected Claim 5 under 35 U.S.C. §103(a) over Golze, Carpenter or Himsl.

In Paragraph 11 of the final Office action dated June 11, 2004, the Examiner rejected Claim 5 stating:

"It would have been obvious to one of ordinary skill to provide in any one of the references above a known commercially available material, as admitted by applicant, for its inherent properties."

Appellant respectfully traverses this rejection, and submits that Claim 5 is not obvious in view of the cited prior art.

Claim 5 depends from Claim 1. As stated earlier, there is no mention whatsoever in Golze, Carpenter or Himsl of at least the feature of a first portion having a first end and a second end, and a second portion comprising a second material having a first end abutting said first end of said first portion and a second end abutting said second end of said first portion, as recited in Claim 1.

In view of the foregoing, it is respectfully submitted that the Examiner fails to establish a *prima facie* case of obviousness because Golze, Carpenter, or Himsl does not disclose all the claim limitations, as recited in Claim 5, which depends from Claim 1.

For at least this reason, Claim 5 is allowable over the applied art, taken singly or in combination. Thus, the Examiner's rejection of Claim 5 under 35 U.S.C. §103(a) over the applied art should be reversed.

G. Claims 8-10 and 15 Are Not Obvious In View Of Carpenter or Himsl and Sturrus

The Examiner rejected Claims 8-10 and 15 under 35 U.S.C. §103(a) over Golze or Himsl in view of Sturrus.

In Paragraph 12 of the final Office action dated June 11, 2004, the Examiner rejected Claims 8-10 and 15 stating:

"It would have been obvious to one of ordinary skill to provide in any one of the references above a double C-shaped section within another C-shaped section as taught by Sturrus in figure 14 in order to strengthen the beam.

As to claim 9, Sturrus has connecting segment at 3.
As to claim 10, the legs are generally orthogonal."

Appellant respectfully traverses this rejection, and submits that Claims 8-10 and 15 are not obvious in view of the cited prior art.

Claims 8-10 and 15 depend from Claim 1. As mentioned above, there is no mention in Carpenter or Himsl of at least the feature of a first portion having a first end and a second end, and a second portion comprising a second material having a first end abutting the first end of the first portion and a second end abutting the second end of the first portion, as recited in Claim 1.

It is respectfully submitted that there is no mention in Sturrus of at least this feature, and thus Sturrus adds nothing to overcome the shortcomings of Carpenter and Himsl. Because the combination of the cited references does not teach all the claim limitations, as recited in Claim 1, the Office action fails to establish a *prima facie* case of obviousness. See *MPEP* §2143.

For at least this reason, Claims 8-10 and 15 are allowable over the applied art, taken singly or in combination. Thus, the Examiner's rejection of Claims 8-10 and 15 under 35 U.S.C. §103(a) over the applied art should be reversed.

H. Claims 16 And 21-23 Are Not Obvious In View Of Golze or Carpenter and Sturuss

The Examiner rejected Claims 16 and 21-23 under 35 U.S.C. §103(a) over Golze or Carpenter in view of Sturuss.

In Paragraph 13 of the final Office action dated June 11, 2004, the Examiner rejected Claims 16 and 21-23 stating:

“It would have been obvious to one of ordinary skill to provide in any one of the references above a double C-shaped section within another C-shaped section as taught by Sturuss in figure 14 in order to strengthen the beam.”

Appellant respectfully traverses this rejection, and submits that Claims 16 and 21-23 are not obvious in view of the cited prior art.

Independent Claim 16 specifies, *inter alia*, a bumper beam comprising a first portion having a generally C-shaped cross-section and comprising a first material, and including a back and two legs extending orthogonally therefrom, and a second portion comprising a second material and including two generally C-shaped sections, each C-shaped section having two legs and a back positioned between the two legs. The second portion further includes a connecting segment positioned between said two generally C-shaped sections, wherein said first portion is attached to the second portion, and wherein the first material of the first portion has a different material property than the second material of the second portion.

It is respectfully submitted that at least this feature is not disclosed, taught or suggested in the applied art, taken singly or in combination.

Independent Claim 21 specifies, *inter alia*, a bumper beam comprising a first portion having a generally C-shaped cross-section and comprising a first material, and including a back and two legs extending orthogonally therefrom, and a second portion comprising a second material, and including two generally C-shaped sections integrally joined to each other, each C-shaped section having two legs and a back positioned between the two legs, wherein one of the two legs of one of the two generally C-shaped sections is integral with one of the two legs of the other one of the two generally C-shaped sections to form one extended

segment between each C-shaped section, wherein the first portion is attached to the second portion, and wherein the first material of the first portion has a different material property than the second material of the second portion. It is respectfully submitted that at least this feature is not disclosed, taught or suggested in the applied art, taken singly or in combination.

(9) Miscellaneous

It is respectfully submitted that the Examiner has conducted a piecemeal examination of the present application. According to *MPEP* §707.07(g),

“Where a major technical rejection is proper, it should be stated with a full development of reasons rather than by a mere conclusion coupled with some stereotyped expression.”

In the present application, the Examiner rejected Claims 1, 2, 3, 6 and 7 under 35 U.S.C. §102(b) by merely stating a conclusion that these claims are anticipated by three references without a full development of reasons.

In addition, according to *MPEP* §707.07(j),

“After indicating that the rejection is under 35 U.S.C. 103, the examiner should set forth in the Office action:

(A) the relevant teachings of the prior art relied upon, preferably with reference to the relevant column or page number(s) and line number(s) where appropriate,

(B) the difference or differences in the claim over the applied references(s),

(C) the proposed modification of the applied reference(s) necessary to arrive at the claimed subject matter, and

(D) an explanation why one of ordinary skill in the art at the time the invention was made would have been motivated to make the proposed modification.

The initial burden is on the examiner to provide some suggestion of the desirability of doing what the inventor has done. ‘To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention or the examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references.’ *Ex parte Clapp*, 227 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985).”

In the present application, the Examiner rejected Claims 3, 4, 5, 8-10, 16 and 21-23 under 35 U.S.C. §103(a) without setting forth the relevant teachings of the prior art relied upon, and preferably with reference to the relevant column or page number(s) and line number(s).

(10) Conclusion

For the above reasons, Appellant respectfully submits that Claims 1-10, 15, 16 and 21-23 are patentable over the applied art, taken singly or in combination. Therefore, the Board is respectfully requested to reverse the Examiner's decision.

Respectfully submitted,

Dated: November 23, 2004

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SIGNATURE OF PRACTITIONER

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Appendix Of Claims On Appeal - Claims 1-10, 15, 16 and 21-23

1. A bumper beam, comprising:
a first portion comprising a first material having a first end and a second end;
and
a second portion comprising a second material having a first end abutting said first end of said first portion and a second end abutting said second end of said first portion, wherein said first material has different material properties than said second material.
2. A bumper beam according to Claim 1, wherein said first material has a generally higher strength than said second material.
3. A bumper beam according to Claim 1, wherein said first material has a different thickness than said second material.
4. A bumper beam according to Claim 1, wherein said first material comprises martensitic steel.
5. A bumper beam according to Claim 1, wherein said second material comprises dual-phase, multiphase, complex-phase or transformation induced plasticity steel.
6. A bumper beam according to Claim 1, wherein said first and second ends of said first portion and said first and second ends of said second portion are fixedly attached to each other.
7. A bumper beam according to Claim 1, wherein said first portion has a generally C-shaped cross-section having a back and two legs extending orthogonally therefrom.
8. A bumper beam according to Claim 7, wherein said second portion includes two generally C-shaped sections, each C-shaped section having two legs and a back positioned between said two legs.

9. A bumper beam according to claim 8, wherein said second portion further includes a connecting segment positioned between said two generally C-shaped sections.

10. A bumper beam according to Claim 8, wherein at least one of said two legs of one of said two generally C-shaped sections extends generally orthogonal with respect to said back.

15. A bumper beam according to Claim 9, wherein said connecting segment is fixedly attached to said back of said first portion.

16. A bumper beam, comprising:
a first portion having a generally C-shaped cross-section and comprising a first material, said first portion including a back and two legs extending orthogonally therefrom;
and

a second portion comprising a second material, said second portion includes two generally C-shaped sections, each C-shaped section having two legs and a back positioned between said two legs, wherein said second portion further includes a connecting segment positioned between said two generally C-shaped sections,

wherein said first portion is attached to said second portion, and

wherein said first material of said first portion has a different material property than said second material of said second portion.

21. A bumper beam according to Claim 16, wherein one leg of said first portion includes a first end and the other leg of said first portion includes a second end, and wherein said one of said legs of said second portion includes a first end abutting said first end of said first portion, and wherein another one of said legs of said second portion includes a second end abutting said second end of said first portion.

22. A bumper beam, comprising:
a first portion having a generally C-shaped cross-section and comprising a first material, said first portion including a back and two legs extending orthogonally therefrom;

and

a second portion comprising a second material, said second portion includes two generally C-shaped sections integrally joined to each other, each C-shaped section having two legs and a back positioned between said two legs, wherein one of said two legs of one of the two generally C-shaped sections is integral with one of said two legs of the other one of the two generally C-shaped sections to form one extended segment between each C-shaped section,

wherein said first portion is attached to said second portion, and

wherein said first material of said first portion has a different material property than said second material of said second portion.

23. , A bumper beam according to Claim 22, wherein one leg of said first portion includes a first end and the other leg of said first portion includes a second end, and wherein said one of said legs of said second portion includes a first end abutting said first end of said first portion, and wherein another one of said legs of said second portion includes a second end abutting said second end of said first portion.

Appendix A

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51 entries found for **end**. The first 10 are listed below.
To select an entry, click on it. For more results, [click here](#).

| | | |
|------------------------|---|---|
| end[1,noun] |  |  |
| end[2,verb] |  |  |
| end[3,adjective] |  |  |
| end[4,transitive verb] |  |  |
| be-all and end-all |  |  |
| bitter end[1,noun] |  |  |

Main Entry: **end** 

Pronunciation: 'end

Function: *noun*

Etymology: Middle English *ende*, from Old English; akin to Old High German *enti* end, Latin *ante* before, Greek *anti* against

1 a : the part of an area that lies at the boundary **b (1) :** a point that marks the extent of something **(2) :** the point where something ceases to exist <world without *end*> **c :** the extreme or last part lengthwise : **TIP d :** the terminal unit of something spatial that is marked off by units **e :** a player stationed at the extremity of a line (as in football)

2 a : cessation of a course of action, pursuit, or activity **b :** **DEATH, DESTRUCTION c (1) :** the ultimate state **(2) :**

RESULT, ISSUE

3 : something incomplete, fragmentary, or undersized : **REMNANT**


4 a : an outcome worked toward : **PURPOSE** <the *end* of poetry is to be poetry -- R. P. Warren> **b :** the object by virtue of or for the sake of which an event takes place

5 a : a share in an undertaking <kcpt your *end* up> **b :** a particular operation or aspect of an undertaking or organization <the sales *end* of the business>

6 : something that is extreme : **ULTIMATE** -- used with *the*

7 : a period of action or turn in any of various sports events (as archery or lawn bowling)

synonym see INTENTION

- **end ed**  /'en-d&d/ *adjective*

- **in the end :** **AFTER ALL, ULTIMATELY**

- **no end :** **EXCEEDINGLY**

- **on end :** without a stop or letup <it rained for days *on*



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Appendix B

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Thesaurus

One entry found for **abut**.

Main Entry: **abut**
Pronunciation: &- 'b&t
Function: *verb*
Inflected Form(s): **abut ted; abut ting**
Etymology: Middle English *abuten*, partly from Old French *aboter* to border on, from *a-* (from Latin *ad-*) + *bout* blow, end, from *boter* to strike; partly from Old French *abuter* to come to an end, from *a-* + *but* end, aim -- more at
<SUP>1butt, <SUP>4butt
intransitive senses
1 : to touch along a border or with a projecting part <land *abuts* on the road>
2 a : to terminate at a point of contact **b** : to lean for support
transitive senses
1 : to border on
2 : to cause to abut

For **More Information on "abut"** go to Britannica.com
Get the **Top 10 Search Results for "abut"**

Pronunciation Symbols

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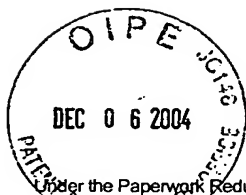
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PTO/SB/17 (10-03)

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FEE TRANSMITTAL for FY 2004

Effective 10/01/2003, Patent fees are subject to annual revision.

☐ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT (\$) 340.00

Complete if Known

| | |
|----------------------|-------------------------|
| Application Number | 10/608,730 |
| Filing Date | June 27, 2003 |
| First Named Inventor | David M. Cumming et al. |
| Examiner Name | D. Pedder |
| Art Unit | 3612 |
| Attorney Docket No. | 209546-81208 |

METHOD OF PAYMENT (check all that apply)☐ Check ☐ Credit Card ☐ Money Order ☐ Other ☐ None☒ Deposit Account:

Deposit Account Number

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Deposit Account Name

Honigman Miller Schwartz and Cohn LLP

The Director is authorized to: (check all that apply)

☒ Charge fee(s) indicated below ☒ Credit any overpayments☒ Charge any additional fee(s) or any underpayment of fee(s)☐ Charge fee(s) indicated below, except for the filing fee to the above-identified deposit account.**FEE CALCULATION** (continued)**3. ADDITIONAL FEES**

| Large Entity | | Small Entity | | Fee Description | Fee Paid |
|--------------|----------|--------------|----------|--|----------|
| Fee Code | Fee (\$) | Fee Code | Fee (\$) | | |
| 1051 | 130 | 2051 | 65 | Surcharge - late filing fee or oath | |
| 1052 | 50 | 2052 | 25 | Surcharge - late provisional filing fee or cover sheet: | |
| 1053 | 130 | 1053 | 130 | Non-English specification | |
| 1812 | 2,520 | 1812 | 2,520 | For filing a request for <i>ex parte</i> reexamination | |
| 1804 | 920* | 1804 | 920* | Requesting publication of SIR prior to Examiner action | |
| 1805 | 1,840* | 1805 | 1,840* | Requesting publication of SIR after Examiner action | |
| 1251 | 110 | 2251 | 55 | Extension for reply within first month | |
| 1252 | 420 | 2252 | 210 | Extension for reply within second month | |
| 1253 | 950 | 2253 | 475 | Extension for reply within third month | |
| 1254 | 1,480 | 2254 | 740 | Extension for reply within fourth month | |
| 1255 | 2,010 | 2255 | 1,005 | Extension for reply within fifth month | |
| 1401 | 330 | 2401 | 165 | Notice of Appeal | |
| 1402 | 340 | 2402 | 165 | Filing a brief in support of an appeal | 340.00 |
| 1403 | 290 | 2403 | 145 | Request for oral hearing | |
| 1451 | 1,510 | 1451 | 1,510 | Petition to institute a public use proceeding | |
| 1452 | 110 | 2452 | 55 | Petition to revive - unavoidable | |
| 1453 | 1,330 | 2453 | 665 | Petition to revive - unintentional | |
| 1501 | 1,330 | 2501 | 665 | Utility issue fee (or reissue) | |
| 1502 | 480 | 2502 | 240 | Design issue fee | |
| 1503 | 640 | 2503 | 320 | Plant issue fee | |
| 1460 | 130 | 1460 | 130 | Petitions to the Commissioner | |
| 1807 | 50 | 1807 | 50 | Processing fee under 37 CFR 1.17(q) | |
| 1806 | 180 | 1806 | 180 | Submission of Information Disclosure Stmt | |
| 8021 | 40 | 8021 | 40 | Recording each patent assignment per property (times number of properties) | |
| 1809 | 770 | 2809 | 385 | Filing a submission after final rejection (37 CFR 1.129(a)) | |
| 1810 | 770 | 2810 | 385 | For each additional invention to be examined (37CFR 1.129(b)) | |
| 1801 | 770 | 2801 | 385 | Request for Continued Examination (RCE) | |
| 1802 | 900 | 1802 | 900 | Request for expedited examination of a design application | |

Other fee (specify)

*Reduced by Basic Filing Fee Paid

SUBTOTAL (3) (\$) 340.00

FEE CALCULATION**1. BASIC FILING FEE**

| Large Entity | | Small Entity | | Fee Description | Fee Paid |
|--------------|----------|--------------|----------|------------------------|----------|
| Fee Code | Fee (\$) | Fee Code | Fee (\$) | | |
| 1001 | 790 | 2001 | 395 | Utility filing fee | |
| 1002 | 340 | 2002 | 170 | Design filing fee | |
| 1003 | 530 | 2003 | 265 | Plant filing fee | |
| 1004 | 770 | 2004 | 385 | Reissue filing fee | |
| 1005 | 160 | 2005 | 80 | Provisional filing fee | |

SUBTOTAL (1) (\$)

2. EXTRA CLAIM FEES FOR UTILITY AND REISSUE

| | Total Claims | Extra Claims | Fee from below | Fee Paid |
|--------------------|--------------|--------------|----------------|----------|
| Total Claims | 15 | -20** = | | 0.00 |
| Independent Claims | 3 | -3** = | | 0.00 |
| Multiple Dependent | | | | |

| Large Entity | | Small Entity | | Fee Description |
|--------------|----------|--------------|----------|--|
| Fee Code | Fee (\$) | Fee Code | Fee (\$) | |
| 1202 | 18 | 2202 | 9 | Claims in excess of 20 |
| 1201 | 86 | 2201 | 43 | Independent claims in excess of 3 |
| 1203 | 290 | 2203 | 145 | Multiple dependent claim, if not paid |
| 1204 | 86 | 2204 | 43 | ** Reissue independent claims over original patent |
| 1205 | 18 | 2205 | 9 | ** Reissue claims in excess of 20 and over original patent |

SUBTOTAL (2) (\$) 0.00

**or number previously paid, if greater; For Reissues, see above

SUBMITTED BY

(Complete (if applicable))

| | | | | | |
|-------------------|-----------------|-----------------------------------|------------------|-----------|----------------|
| Name (Print/Type) | Peter J. Rashid | Registration No. (Attorney/Agent) | 39,464 | Telephone | (248) 566-8508 |
| Signature | | Date | December 3, 2004 | | |

Fee Transmittal

I hereby certify that this correspondence is being deposited with the U.S. Postal Service with sufficient postage as first class mail, in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on the date shown below.

Dated: December 3, 2004

Signature:

(Julie A. Barber)